

WHAT IS CLAIMED IS:

- 1 1. A method for detecting a position of an impulse response in a
2 multipath channel comprising:
3 (a) receiving a transmitted signal as a received signal;
4 (b) correlating a representation of the received signal with a pseudo-random
5 number (PN) sequence to produce an evaluation signal, the PN sequence being used to
6 produce the transmitted signal, the evaluation signal comprising a plurality of peak values;
7 (c) identifying a first peak value from among the plurality of peak values;
8 (d) determining a position in the evaluation signal of the first peak value,
9 wherein the position is representative of time;
10 (e) determining a threshold value based on the evaluation signal;
11 (f) comparing the threshold value with one of the peak values to produce a
12 comparison result; and
13 (g) based on the comparison result, determining whether to:
14 produce a new evaluation signal based on the evaluation signal; and
15 repeat the steps (c) - (g) using the new evaluation signal,
16 wherein a plurality of first peak values are accumulated,
17 wherein a position of an impulse response corresponds to the first peak value
18 in the plurality of first peak values whose associated time is the earliest.
- 1 2. The method of claim 1 wherein the new evaluation signal is produced
2 by subtracting a template signal from the evaluation signal.
- 1 3. The method of claim 1 wherein the threshold value is based on the
2 peak values comprising the evaluation signal, exclusive of the first peak value.
- 1 4. The method of claim 1 wherein the threshold value is based on a ratio
2 between the first peak value and the other peak values comprising the evaluation signal.

1 5. Apparatus for identifying a position of an impulse response in a
2 multipath channel comprising:
3 a data processing unit; and
4 a memory component in data communication with the data processing unit, the
5 memory component containing a first memory configured with computer program code,
6 the computer program code configured to operate the data processing unit to
7 perform the method steps as recited in claim 1.

1 6. A signal detection method comprising:
2 (a) receiving a transmitted signal as a received signal, the transmitted signal
3 comprising a first signal correlated with a pseudo-random number sequence, the first signal
4 representative of an information signal, the received signal comprising one or more reflected
5 signals and a line-of-sight signal;
6 (b) producing a matched signal from the received signal;
7 (c) correlating the matched signal with the pseudo-random number sequence
8 to produce a correlated signal, the correlated signal comprising a main lobe and a plurality of
9 side lobes;
10 (d) determining a peak value of the main lobe;
11 (e) determining a time value associated with the peak value of the main lobe;
12 (f) determining a threshold value based on the correlated signal; and
13 (g) if the threshold value exceeds a value based on the side lobes, then
14 subtracting a template signal from the correlated signal to produce a new signal and repeating
15 the steps (c) - (g) with the new signal, wherein the threshold value is recomputed with each
16 iteration of the steps (c) - (g),
17 wherein a plurality of time values are produced,
18 wherein the smallest of the time values represents the arrival time of the line-
19 of-sight signal.

1 7. The method of claim 6 wherein the first signal is the information
2 signal.

1 8. The method of claim 6 wherein the threshold value is based on peak
2 values of the side lobes.

1 9. The method of claim 6 wherein the threshold value is based on a ratio
2 between the peak value of the main lobe and a peak value of each side lobe.

1 10. A signal detection processor comprising:
2 means for receiving a digital signal, the digital signal representative of a
3 transmitted signal, the transmitted signal formed by correlating an information signal with a
4 PN sequence;
5 means for correlating the digital signal with the PN sequence to produce a
6 correlated signal;
7 means for detecting a peak value in the correlated signal including associating
8 a time value representative of the position of the peak value in the correlated signal;
9 means for determining a threshold value based on the correlated signal;
10 means for producing a new correlated signal from the correlated signal; and
11 means for repeating the process using the new correlated signal, if a
12 comparison of the threshold value with the correlated signal produces a first comparison
13 result,
14 thereby accumulating a plurality of peak values.

1 11. The processor of claim 10 wherein the means are provided as computer
2 program code.

1 12. The processor of claim 10 wherein the recited means are performed on
2 a data processing unit.

1 13. The processor of claim 10 wherein the means for determining a
2 threshold is based on peaks in the correlated signal exclusive of the detected peak value.

1 14. The processor of claim 10 wherein the means for producing a new
2 correlated signal includes subtracting a template signal from the correlated signal.